

Appln. No. 10/787,516

Attorney Docket No. 10544-288

II. Remarks

Claims 36-59 stand rejected. Claims 36-38 and 41-59 are being amended, and claims 39 and 40 are being cancelled. Accordingly, after entering the above amendments, claims 36-38 and 41-59 remain pending.

As amended, claim 36 is directed to an x-ray optical system for analyzing a sample. The system includes an adjustable first aperture that adjusts convergence of an x-ray beam by selecting a portion of the x-ray beam delivered by an optical element and a second aperture that maximizes flux incident on the sample by occluding a portion of the x-ray beam to reduce background radiation around the sample. The first aperture is positioned between the optic and the sample, and the second aperture is positioned between the first aperture and the sample.

Reconsideration of this application in view of the above amendments and the following remarks is herein respectfully requested.

Drawing Objections

The drawings have been objected to under 37 C.F.R. 1.83(a). In response, claims 39 and 40 have been cancelled. Accordingly, Applicant respectfully requests withdrawal of the objections to the drawings.



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Appln. No. 10/787,516

Attorney Docket No. 10544-288

Claim Objections

Claim 42 has been objected to for various formalities. In response, claim 42 has been amended as suggested by the Examiner. Accordingly, Applicants respectfully request withdrawal of the objections to the claims.

Claim Rejections - 35 U.S.C. §102

Claims 36, 38, 42-44, 52, 53, 55, and 57-59 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application 2002/0064253 to Gutman (Gutman '253). And claims 36, 42-44 and 52 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Application 2001/0028699 to Iwasaki et al. (Iwasaki).

Gutman '253 discusses an optical unit with an entrance slit (9) and an exit slit (11) mounted on a metal housing (8). A set of conditioning optics (10) is also mounted on the housing (8) between the entrance slit (9) and the exit slit (11). The entrance slit (9) is located between a source and the optics (10), and the exit slit (11) is located between the optics (10) and a sample that is being analyzed with the optical unit.

Hence, Gutman '253 does not describe an x-ray optical system with an adjustable first aperture positioned between an optic and a sample to adjust convergence of an x-ray beam by selecting a portion of the x-ray beam delivered by an optical element and a second aperture positioned between the first aperture and the sample to maximize flux incident on the sample by occluding a portion of the x-ray beam, as now required by amended claim 36.

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Iwasaki discusses an optical device with a multilayer mirror (1) and first, second and third slits (4, 5, 6) located between the mirror (1) and a sample (S). The first and second slits (4, 5) are stationary, and the third slit (6) is variable. Since the first slit (4) is not variable, that is, not adjustable, it cannot adjust the convergence by selecting a portion of an x-ray beam delivered by an optical element. As shown in Figure 1, the stationary slit (4) is located between mirror (1) and the sample (S), and the variable slit (6) is located between the stationary first slit (4) and the sample (6).

Hence, Iwasaki does not describe an x-ray optical system with an adjustable first aperture positioned between an optic and a sample to adjust convergence of an x-ray beam and a second aperture positioned between the first aperture and the sample to maximize flux incident on the sample, as now recited in amended claim 36.

Accordingly, neither Gutman '253 nor Iwasaki teaches each and every element recited in amended claim 36. Therefore, reconsideration of the rejections under 35 U.S.C. § 102 and allowance of claim 36 are respectfully requested.

Further, since claims 38, 42-44, 52, 53, 55, and 57-59 depend from claim 1, directly or indirectly, the reasons for allowance of claim 36 apply as well to the dependent claims.



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Attorney Docket No. 10544-288

Claim Rejections - 35 U.S.C. §103(a)

Claims 36 and 37 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,041,099 to Gutman (Gutman '099) in view of U.S. Patent 6,330,301 to Jiang (Jiang). Claim 37 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Iwasaki in view of Jiang. Claims 38, 41, and 48-51 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Gutman '099 and Jiang in view of U.S. Patent Application 2003/0152192 to Hasegawa (Hasegawa). Claims 38 and 39 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Gutman '099 and Jiang in view of U.S. Patent No. 3,866,047 to Hounsfield (Hounsfield). Claims 38 and 40 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Gutman '099 and Jiang in view of U.S. Patent No. 5,204,533 to Simonet (Simonet). Claims 45-47, 54, and 56 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Gutman '253 in view of U.S. Patent No. 6,014,423 to Gutman (Gutman '423). And claims 45-47 and 53-56 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Iwasaki in view of Gutman '423.

Gutman '099 discusses an optical apparatus with an aperture (58) and an optic (5) which conditions an x-ray beam. The Examiner acknowledges that Gutman '099 fails to disclose an aperture that adjusts convergence of an x-ray beam by selecting a portion of the x-ray beam delivered by an optical element, but relies on Jiang for teaching such a feature.

The feature of Jiang's system that the Examiner refers to, however, is a pinhole plate (34) with an alignment window (36) equipped with a triangle nose



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Appn. No. 10/787,516

Attorney Docket No. 10544-288

(38) and a pinhole (40). The pinhole (40) is located at a fixed distance from the vertex (37) of the triangle (38). Thus, when an x-ray beam is at the vertex (37), the pinhole plate (34) may be precisely indexed to the known distance to the pinhole (40), ensuring precise alignment of the pinhole (40) and the x-ray beam, such that the position of the x-ray beam is known. As such, the pinhole plate (34) is employed to align an x-ray beam. It is not employed to adjust the convergence of the x-ray beam by selecting a portion of the x-ray beam delivered by an optical element, as required by amended claim 36.

Accordingly, since Jiang does not cure the deficiencies of Gutman '099, the combination of Gutman '099 with Jiang does not describe an x-ray reflective optical system with an adjustable first aperture positioned between an optic and a sample to adjust convergence of an x-ray beam and a second aperture positioned between the first aperture and the sample to maximize flux incident on the sample by occluding a portion of the x-ray beam, as now required by amended claim 36.

Therefore, reconsideration of the rejections under 35 U.S.C. § 103 and allowance of claim 36 are respectfully requested. Further, since claims 37-41, 45-51, and 53-56 depend from claim 36, directly or indirectly, and since none of the secondary references (Hasegawa, Hounsfield, Simonet, and Gutman '423) cures the deficiencies of either Gutman '099 or Jiang, the reasons for allowance of claim 36 apply as well to the dependent claims.



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Conclusion

In view of the above amendments and remarks, it is respectfully submitted that the present form of the claims (claims 36-38 and 41-59) are patentably distinguishable over the art of record and that this application is now in condition for allowance. Such action is respectfully requested.

Respectfully submitted by,

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